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Reading Comprehension and Strategy Use in English Language Learners and Monolingual Children

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Graduate Program in Education
A thesis submitted in partial fulfillment of the requirements for the degree in Master of Arts
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Abstract

Children with a home language other than English (English Language Learners, or, ELLs) need good English reading comprehension skills to be successful in Canada. This research examined the differences in reading comprehension between ELLs and monolinguals (EL1s), reading strategies used, and predictors of successful reading comprehension. 57 students in grade 4 and 5 participated: 27 EL1s and 32 ELLs. They were tested for vocabulary knowledge, reading fluency, decoding, and reading comprehension. EL1s performed significantly better on reading comprehension and most language measure tasks. For reading strategies, necessary inferencing and predicting were used significantly more by the EL1s than the ELLs, and the ELLs used vocabulary significantly more. For EL1s, predictors for successful reading comprehension were reading fluency, vocabulary knowledge, and elaborative inferencing. For ELLs, predictors were vocabulary knowledge, decoding, necessary and elaborative inferencing, sentence structure, and summarizing. Results will be discussed in relation to theories of reading comprehension.

Keywords

Reading comprehension, reading strategies, ELL children, bilingualism, language proficiency, vocabulary knowledge

Acknowledgments

I would like to thank my supervisor, Dr. Deanna Friesen, for her continuous support and guidance throughout my thesis. I would also like to thank Kayla Edwards and Angela Celebre for assisting with data collection and coding, as well as Bailey Frid for her guidance and mentorship.

I would not be where I am without my family. I would like to thank my amazing parents, Richard and Tamara Schmidt, for their unwavering support and complete faith throughout my entire academic career. I would also like to thank my brother, Marcus Schmidt, for his continued encouragement, even while pursuing his own education on the other side of the continent. Last but not least, I would like to thank my partner, Robert Tryon, for being my rock through it all.

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Chapter 1

1 Introduction

Canada is known to be a multicultural country, and this is evident in the linguistically diverse landscape that makes up Canada's population. This language diversity has been continuously increasing as Canada becomes more and more multicultural. A report by Statistics Canada in 2016 showed that 22.9% of people living in Canada have a native language other than English or French, which rose from 21.3% in 2011. This increase has been attributed to an increase in immigration. Children in Canada with a native tongue other than English will need to learn English to be successfully included into the Canadian school system. Research suggests that learning a second language is age dependent, meaning that it tends to be easier for a child to learn a second language than an adult (Juffs, 2011), however, despite children having the ability to more readily learn a second language, second language students may not attain the same level of proficiency as their first language peers without quality instruction (Lindholm-Leary & Hernandez, 2011).

With an increasing immigrant population in Canada, more and more students have a first language other than English, and will need to learn to read in English. For the rest of their academic lives, these English Language Learners (ELLs) will need good reading comprehension skills to be able to navigate successfully through elementary school, high school, university or college, and in their future careers (August & Shanahan, 2006; Polinsky & Kagan, 2007). Monolinguals whose native language is English, or EL1s, have previously been shown to have better reading comprehension abilities in English than ELLs (Geva & Farnia, 2012), even though word reading abilities are similar between the two groups (August & Shanahan, 2006). This is not unexpected because ELLs must divide their time and attention between their two languages, and therefore have less exposure to English. The current research examined the differences that exist in reading comprehension performance between ELLs and EL1s elementary school children, as well as the reading strategies they use, and if these strategies are predictors of their reading comprehension success.

1.1 Understanding Reading Comprehension

Reading comprehension skills are very important for both the academic and career success (August & Shanahan, 2006; Polinsky & Kagan, 2007). They are what helps people understand the material they read, and to successfully encode and store information. Comprehension involves more than just word reading and language proficiency, it requires the reader to not only identify the explicit information that is directly found in the text, but the implicit, or implied, information as well (Kendeou, McMaster & Christ, 2016). If the reader cannot make the inferences that are fundamental to comprehension and identify the implicit information, then they will not comprehend the meaning of the text while reading. For example, in a story that describes a boy that threw a baseball at a window, and later his mother finds broken glass and the baseball in the house, the necessary inference would be that the boy broke the window with the baseball because that information is not directly stated in the story. Making inferences are critical in reading comprehension and requires that the reader to use background knowledge to bridge any gaps between concepts and information in the text (Graesser, Singer, & Trabasso, 1994; Kintsch, 1998; Elbro & Buch-Iversen, 2013). Making inferences is a skill that children start to develop before they start formal education by making connections between what they see, hear or what they experience (Kendeou et al., 2016). Without making inferences, the overall meaning of the text might be lost. For example, in the above story, if the next part of the story was that the boy got in trouble from his mother, the reader who did not make any inferences would not be able to understand the reason for his punishment. Clearly, inference making is a critical reading strategy in reading comprehension; more reading strategies will be discussed further on.

There are several theories of reading comprehension that both explain how readers understand text and how text comprehension skills develop. In an example of the latter, the Simple View of Reading (SVR; Hoover & Gough, 1990) postulates that reading comprehension is a product of two components: decoding and language comprehension. Decoding refers using spelling-sound correspondences to identify words outside of meaning, and language comprehension refers to understanding meaning based on vocabulary and grammatical knowledge (Kendeou et al., 2016). There is robust evidence

to support this model by research done with both monolingual English-speaking children (Kendeou, Savage, & van den Broek, 2009; Catts, Adlof, & Weismer, 2006), and bilingual ELL children (Bonifacci & Tobia, 2017). For the ELL children, language comprehension was shown to be the biggest predictor of reading comprehension, followed by reading accuracy only in the younger children, ages 6-8 (Bonifacci & Tobia, 2017). However, the SVR model is a simple model of reading comprehension by only recognizing two important components of comprehension. Researchers have criticized the SVR model for being overly simplistic and that it ignores the complexity and multidimensional aspects of reading comprehension (Catts, 2018). For example, the SVR model does not include or explain some vital reading strategies, such as inference making, because it does not fall under decoding or language comprehension.

The Construction-Integration model (CI model; Kintsch & van Dijk, 1978; Kintsch, 1998) on the other hand, describes the development of different levels of reading representation. The CI model states that reading comprehension is a combination of both the text content and the appropriate background information to create a mental representation of the overall gist of the text. The situation model is the component of the CI model that involves that integration of all the necessary cognitive processes (ex. working memory, decoding), involved in comprehension to create that mental representation (Kintsch & van Dijk, 1978; Kintsch & Mangalath, 2011). The Construction-Integration model (CI; Kintsch & van Dijk, 1978) has been an influential model in how reading comprehension is understood to inform further research. It uses the concept from the situation model of forming a mental representation of the meaning of the text, but describes this process as being driven by integrating the information gathered from the text and the appropriate contextual knowledge. When comparing this model to the Simple View of Reading model, the CI model and the SVR model seem to serve different functions. The Simple View of Reading model explains how the reader is able to access meaning from the text by describing the pre-requisite skills needed, as opposed to how the text is actually understood. Whereas the CI model describes how the reader makes a mental representation of the text while reading it. While the SVR may be more simplistic, it recognizes the importance of surface reading functions such as word decoding and language comprehension. Whereas the CI model recognizes reading

comprehension as more complex by going deeper to describe the integration of text-based and background knowledge to create a mental image of the text. Each model explains a different component of reading comprehension, making them each valuable in understanding reading comprehension. Recognizing the theoretical background of reading comprehension creates a strong foundation of understanding to then examine the discrepancies in comprehension between ELLs and EL1s and speculate why they might exist.

1.2 ELL and EL1 Differences

The literature demonstrates that there are differences in reading comprehension performance between ELL and EL1 populations, partially because reading comprehension relies heavily on language knowledge. EL1s begin to learn English at a very young age, and therefore have considerable familiarity with English vocabulary, sentence structure, grammar and syntax. For example, an EL1 starting Kindergarten in Canada will most likely have most of their language knowledge and know the meaning of 2300-4700 root words (Biemiller, 2009). Root words are words whose simple meaning can be drawn upon to interpret the meaning of more complex words and can have prefixes and suffixes added (ex. it is easier to understand the word “running” when the meaning of the root word “run” is known) (Biemiller, 2009). Since ELLs also begin to learn their native language at a young age, they most likely have a comparable knowledge of their native vocabulary to EL1s when they begin Kindergarten. However, since learning English is important in the Canadian school system and English is not their first language, ELL students learn English later than EL1s, so ELLs will consequently have less language knowledge than EL1s (Bialystok, Luk, Peets & Yang, 2010). This includes less knowledge of English vocabulary, grammar and syntax. This means that ELLs who are not as proficient in English may experience a knowledge gap between themselves and their monolingual peers because of their difference in exposure to English (Droop & Verhoeven, 2003).

Differences in the degree of language exposure in reading comprehension was demonstrated in research done by Droop and Verhoeven (2003), who conducted longitudinal research looking at both monolinguals and second language learners in the

Netherlands over a span of two years (Grades 3 and 4). They found that the monolingual children had better reading comprehension and oral language proficiency than the second language learners. Interestingly, the second language learners were actually quicker at word decoding than the monolinguals suggesting that word decoding is necessary but not a sufficient aspect of reading comprehension. If word decoding was more influential in comprehension, it would have been expected that it would have impacted the difference between first and second language users and it does not seem to. The researchers then concluded that reading comprehension is affected by comprehension processes and language knowledge in a top-down fashion, as opposed to bottom up word-decoding, which is consistent with the CI model previously mentioned. This may put second language learners at a disadvantage because they have less language knowledge than their EL1 peers, making the top-down processing more difficult.

Examining the differences between these two groups has also offered further insights and understanding of reading comprehension and its various components. One longitudinal study by Geva and Farnia (2012) examined the development of language proficiency and reading fluency of ELLs and EL1s in Canada. In Grade 2, the children's cognitive abilities, language proficiency, word-level reading and reading fluency were examined and measured using a variety of tests, and then measured again when they were in Grade 5. The researchers replicated previous findings that EL1s had better reading comprehension than the ELLs overall, however, the ELLs and EL1s did not differ on phonological awareness, rapid automatized naming, working memory and word-reading fluency (Geva & Farnia, 2012). They found that the Grade 5s reading comprehension was predicted by different components found in Grade 2 between the ELLs and EL1s. Some of the predictors were similar, like non-verbal ability, word identification, vocabulary, naming speed and text fluency; but some were also different, like syntactic skills for ELLs (Geva & Farnia, 2012). These results bring one to question what is happening to cause the comprehension differences between the two groups, when their cognitive processes and word-reading fluency are similar. Since comprehension is more complex than originally thought, it requires a more detailed framework for understanding and testing the components involved in reading comprehension. One other possibility lies in the dynamic nature of reading fluency, and how it is more complex than just word-

reading fluency. Word-reading fluency and text-reading fluency become more distinct from one another as children age, and ELIs might perform better in text reading fluency because of their previous language knowledge and their top-down processing of the text (Geva & Farnia, 2012). A second possibility is the involvement of reading strategies, and if their use contributed to the difference between the groups. This study did not examine reading strategies at all, and if the students are engaging in them differently based on group, it might explain the differences in reading comprehension.

1.3 Utilizing Reading Strategies

Reading strategies are the tools that we use to understand and interpret the text we are reading. Utilizing reading strategies is an integral part of effective reading comprehension (Park & Kim, 2015). There are a variety of different strategies that can be used, such as inferring from texts, making connections, monitoring comprehension and dialoguing (Park & Kim, 2015). Examples of some effective strategies that have been shown among monolingual children are comprehension monitoring, making inferences, and utilizing background information to gain a better understanding of the text (Cain et al., 2004). It has previously been shown that people who are good comprehenders utilize reading strategies better and more effectively than the poor comprehenders, showing that using reading strategies are important in overall comprehension (Cain & Oakhill, 2006).

Reading strategies are a type of metacognitive knowledge which regulate and govern other cognitive processes, such as reading comprehension, which changes and grows as children mature (Muijselaar et al., 2017). It is curious whether or not this improvement is due to: the maturation of the child's brain and cognitive processes, children gaining experience as they read more, explicit instruction, or if it is a combination of any or all of the above.

Not only are reading strategies important for reading comprehension, but the type of reading strategy utilized is critical for reading comprehension success. Cain, Oakhill and Bryant (2004) looked at predictors of reading comprehension and reading strategy use with a monolingual population. They examined the same children at ages 8, 9, and 11. They tested their reading skills, vocabulary, working memory and reading strategies, along with reading comprehension. They found that working memory and the type of

reading strategies the children used were significant predictors of reading comprehension success. However, two of the strategies, inference making and comprehension monitoring were not mediated by working memory, but rather they predicted reading comprehension on their own. The type of strategy used with reading can have a significant impact on reading comprehension overall. Even though this research was done with monolinguals, if specific reading strategies can be found to be effective for ELLs, it could have many implications for their academic success, and potentially future career success.

When children learn reading strategies can also impact their reading comprehension success. In a longitudinal study in the Netherlands, Muijselaar et al. (2017) examined how reading strategies and reading comprehension relate in a developmental context in students from grade four to the end of grade five. The majority of the children (96%) spoke Dutch as a first language, and only 4% of the students spoke Dutch as a second language. They found that having knowledge of reading strategies at a younger age allowed for better reading comprehension later on. The fact that learning reading strategies at an earlier age leads to better reading comprehension later poses a challenge for ELL students when compared to EL1 students because ELL students are not learning English as earlier as EL1 students. This means that EL1 students are already at an advantage because of the age in which they are speaking and reading in English, and ELL students may have a more difficult time transferring reading skills and strategies from their native language to English if they do not have a good English language knowledge (Cummins 1981, 2000). However, the researchers also found that as students read more difficult texts in later life, their knowledge of reading strategies increased, because they had to bridge the larger gap between concepts in the increasingly difficult texts. The use and knowledge of reading strategies increases developmentally and relationally with reading comprehension acquisition. However, the researchers in this study did not examine inference making, which is a cornerstone reading strategy for successful reading comprehension (Kendeou et al., 2016), therefore, it is important to include inferencing in future research, as it has been found to be is an effective reading strategy. Reading strategies are a large part of reading comprehension and can be used to be more successful readers. Examining which strategies are used by ELLs and how they relate to

successful comprehension can help us understand how to help ELLs boost their understanding of material in an educational setting.

Due to the differences in reading comprehension between ELL and EL1 students, it cannot be assumed that ELL students engage in the same reading strategies as EL1 students, thus this population must be examined separately. Through a case study, Park and Kim (2015) examined the different reading strategies that were used by four ELLs in Grade 4 and 5 while reading computer-based texts, both at home and at school. The researchers created five categories of reading strategies, which were: accessing computer-based texts, use of computer literacy, making critical decisions, dialogic connection, and active participation in computer-based text reading activities. The researchers found that the most used strategy was engaging in dialogue with themselves or hypothetically with the text, which facilitated deriving meaning from the text. Their findings should be viewed cautiously given their small sample size. Further research by Garcia and Godina (2017) with Spanish and English bilinguals showed a slightly different result. This study also used a qualitative design and think-aloud task, texts in both Spanish and English, with six Mexican-American children in grade 4. The most common reading strategies used were translating and code-mixing, in which elements from one language are used to derive meaning in another language. Some of the children in the study had higher English proficiency than others, and they found that those were more likely to think-aloud in English after reading the English text, as opposed to the children who were less proficient in English would think-aloud in Spanish. This result is logical since translating was a strategy that is commonly used, so the participant would think-aloud in Spanish after translating the text from English to Spanish. The strategies used seemed to be uniform across both languages, except for some general strategies, such as paraphrasing and re-reading, that were used in English and not Spanish (Garcia & Godina, 2017).

Jiménez, García, and Pearson (1996) also examined the differences in reading strategy use between monolinguals and bilinguals. They examined three groups of 11-13 year-old children: 8 Latina/o children who were identified as successful English readers, 3 English monolinguals, and 3 Latina/o children identified as poor English readers. The successful Latina/o readers utilized translating, resolving unknown vocabulary, monitoring their

reading comprehension, connecting to background information, making inferences and questioning to aid in reading. Because they encountered more unknown vocabulary than the English monolinguals, the successful Latina/o readers had to devote cognitive resources to resolving vocabulary obstacles than to comprehension (Jiménez, García, & Pearson, 1996). In comparison, the English monolinguals could devote all cognitive power to comprehension because they rarely encountered vocabulary they did not know. The less successful Latina/o readers utilized less reading strategies and encountered a lot of unknown vocabulary that they had trouble interpreting. While all these studies examined reading strategies, they did not relate them to reading comprehension success. Therefore, it is important to further examine reading strategies and how children are using them to aid in reading comprehension. This will enable a better understanding of how ELL students engage with the material and could then be used by teachers to help ELL children leverage reading strategies to improve comprehension.

1.4 Current Gaps in the Literature

There are some gaps in the literature regarding ELLs and reading strategy use that have not been examined in the past. As seen above, many studies have examined reading comprehension. What makes this research unique is that it will examine the strategies used for reading comprehension, and how different strategy use is related to reading comprehension performance. If reading strategies utilization in ELLs could be better understood, educational programs for ELL students could be tailored to increase reading comprehension success. This could be done by teaching those students the specific reading strategies that have been shown to be effective in reading comprehension for this specific population, thus increasing their chances of being effective readers and students.

1.5 This Research

This study examined ELL and EL1 children in grades 4 and 5 for reading comprehension and reading strategy use. They were tested on reading comprehension and on various language measures, which tested their word reading fluency, decoding, and vocabulary knowledge. While engaging in the reading comprehension task, the students were asked to perform “think-alouds” where they were invited to say whatever they were thinking

while they read a text on the computer. These “think-alouds” were analyzed and coded to assess which strategies the students were engaging in. At the end of each story, the students were asked questions about the text to assess their comprehension. A full description of the methodology can be found further on.

The research questions were: 1) Are there differences in performance on reading comprehension and language measures between ELL and EL1 students in grades 4 and 5?, 2) how does reading strategy use differ between the groups?, 3) what variables (i.e., reading strategies, word fluency, vocabulary) are correlated with reading comprehension performance in each group?, 4) Which variables best predict reading comprehension success?, and 5) how are reading strategies correlated with each other?

For research question 1, it was hypothesized that EL1 students would perform better than ELL students on the reading comprehension task, the word reading fluency task, and the vocabulary task, but not the decoding task. This is predicted because previous research has shown that ELL students might be faster decoders than EL1 students, but it is expected that EL1s would be better comprehenders, have more English vocabulary knowledge and be quicker readers due to experience with English, which is consistent with the existing literature (Geva & Farnia, 2012; Droop & Verhoeven 2003). For research question 2), it was hypothesized that there would be a difference in reading strategy recruitment between the groups because of the relationship between reading comprehension and reading strategy use. Since EL1 students have been shown to be better comprehenders overall, it seems as though they would recruit reading strategies differently than ELLs. It was also thought that ELL students may engage in more reading strategies than EL1 students. This prediction was derived from the idea that the children with lower language proficiency will need to engage more reading strategies to compensate for less language knowledge. In regards to research questions 3), it was expected that vocabulary and some reading strategies would be correlated with reading comprehension, as vocabulary knowledge (Geva & Farnia, 2012) and reading strategies (Park & Kim, 2015) are essential for reading comprehension. It was also expected that inferencing would be correlated with successful reading comprehension because of the important role it plays in reading comprehension (Kendeou et al., 2016; Cain, Oakhill &

Bryant, 2004; Elbro & Buch-Iversen, 2013). It was hypothesized for 4) that ELLs and ELIs would have a different combination of variables that best predicted reading comprehension. As mentioned above, it is expected that the ELLs reading comprehension success would be predicted by the use of more reading strategies, given their lower language proficiency. For research question 5), this was an exploratory question and as such, direct hypotheses were not made, but it would be interesting to examine how the various strategies were related to each other.

There are many important implications this research can have for the education of ELLs. It might be able to uncover what strategies ELLs use to aid in reading comprehension, and if specific strategies are used often and are successful for ELLs, schools can then potentially develop programs to teach those strategies to ELLs and hopefully help them improve their reading comprehension. This could in turn affect their future careers and enrich their lives, while contributing to a more multicultural and inclusive Canada.

Chapter 2

2 Method

2.1 Participants

Students in grades 4 and 5 were recruited from four schools in a large school board in Southwestern Ontario. Examining students in Grade 4 and 5 is important because Grade 4 is when children are transitioning from learning to read to reading to learn (Chall, 1983; Chall & Jacobs, 2003), so reading comprehension skills become more important so the students can actually encode and retrieve the material they are reading. To be assigned to the ELL group, participants had a first language other than English. A total of 65 students had parental consent for this study, however 6 participants were excluded due to recommendations from their teachers based on low English ability or behavioural concerns, being away on vacation, or declining to participate. The final sample included 59 participants in total, with a mean age of 10.3 years for both groups. Of those 59 students, 27 were assigned to the EL1 groups and 32 to the ELL group. The EL1 group consisted of 11 males and 16 females, 13 grade 4 students and 14 grade 5 students. Of these students, 24 students were native to Canada, 2 were from the United States, and 1 was born in Germany. The ELL group contained 15 males and 17 females, 20 grade 4 students and 12 grade 5 students. Out of these students, 9 of the children were born in Canada, 5 were born in the United States, and 8 were born in Syria. The rest of the ELL students came to Canada from various countries: Ethiopia, Germany, India, Lebanon, Libya, Pakistan, Saudi Arabia, South Korea, Turkey, and United Arab Emirates. The mean number of years the ELL students have lived in Canada was 6.75, and 17 of the ELL participants have lived in Canada for 3 years or less. About half of the ELL students spoke Arabic (16 students) as their first language. Other students spoke Bosnian (2), Punjabi (2), Amharic (1), Korean (1), Kurdish (1), Portuguese (1), Russian (1), Spanish (1), Tamil (1), Turkish (1) and Urdu (1). To accommodate 9 ELL students who were struggling with decoding, at least one story was read aloud by the researcher. When doing the reading comprehension task, the researchers invited the students to answer in whatever language they felt most comfortable using for both the think-alouds and comprehension questions to aid in their overall reading comprehension.

2.2 Materials

2.2.1 Language Experience Questionnaire

The questionnaire, which was developed for this study, included questions about the student's language experience at home, how often they speak English or another language, as well as their preferred language. It also asks about the parents' first language and how often they speak either English or another language to their children. The questionnaire can be found in Appendix A.

2.2.2 Reading Comprehension Measure

The Gray Oral Reading Test (GORT; Wiederholt & Bryant, 2001) was adapted for use in this study. Four texts of increasing level of difficulty were administered on the computer. The students were presented the story two sentences at a time, and when the students were finished reading the two sentences and were ready, they would press the spacebar. Upon pressing the space bar, they would be prompted by a beep to perform a "think aloud", in which they were invited to say what is on their mind in regard to the story. They were provided with a prompt sheet with potential sentence starters (see Appendix B). These think alouds were recorded with the participant's permission and analyzed for strategy use. The strategies and their coding definitions can be found in Appendix C. After each story was completed, there were three comprehension questions that were asked on the computer that the participant answered aloud. These were also recorded and were scored for accuracy. One question was a literal question, in which the answer could be found directly within the text. Another question was a necessary inference question which tests the participant's ability to fill in the gaps of the story and make inferences based on the available information. The last type of question was an elaborative question which asks the participant to think beyond the story and identify potential motivations, reasons and outcomes. The coding for both the reading strategies and the reading comprehension questions was performed by one coder and checked by a second coder, and disagreements were reached by consensus.

2.2.3 English Vocabulary and Word Reading Efficiency

The Peabody Picture Vocabulary Test (PPVT-III; Dunn & Dunn, 1997) was used to test English language proficiency. This test was used as a proxy for language knowledge. For this test, a series of four images appeared on a screen, and the participant heard a word and selects the corresponding picture that matched the word. The test begins on a set of words that was appropriate for their age. If the participant obtains fewer than 2 errors on a single set of 12 words, then this becomes the student's basal level. If they make more than 2 errors, they are then moved down to an easier set until their basal level can be determined. The student is finished the test when they make more than 8 errors on a single set of 12 words. Their score is then determined by adding the number of correct answers to the total number of words in the preceding basal blocks. This is because it is assumed that the student would have successfully completed the easier basal blocks that preceded their basal level.

The Test of Word Reading Efficiency (TOWRE, Torgesen, Wagner, & Rashotte, 1999) tested the student's word reading efficiency. The TOWRE consists of two lists of progressive difficulty, one of English words and one of English pseudowords (e.g., non-words that follow English spelling-sound correspondences). For each test, the participant is asked to read as many items on the list as possible in 45 seconds and the number that they read correctly is calculated.

2.3 Procedure

Information packets were sent home with the students from participating classes. This package contained a letter of information, a consent form, and a Language Experience Questionnaire for the parents to complete. The aim of the questionnaire is to determine the children's language background. The results of the questionnaire were analyzed and the groups formed. The students were tested twice in a span of two weeks, each for 20-30 minutes, and gave assent before testing began. In the first testing session, the participants performed the TOWRE and the PPVT, which were a part of a larger test battery that was not discussed here. In the second session, the participants completed the Reading Comprehension task. The testing took place in a quiet environment within the school

(e.g., the library). The students were then be debriefed verbally including a simplified version of the research question and the hypothesis, and questions are invited. This study was approved by the University's Ethics Board (see Appendix D) and the participating school board's Ethics Review Committee.

Chapter 3

3 Results

Five questions were addressed through this research. These were: 1) Are there differences in performance on reading comprehension and language measures between ELL and EL1 students in grades 4 and 5?, 2) how does reading strategy use differ between the groups?, 3) what variables (i.e., reading strategies, word fluency, vocabulary) are correlated with reading comprehension performance in each group?, 4) Which variables best predict reading comprehension success?, and 5) how are reading strategies correlated with each other? This section will examine the results associated with each research question in turn.

3.1 Group Differences on Task Performance

Overall, the EL1 students performed better than the ELL students on all of the language measures (See Table 1). On the English vocabulary measure (i.e., the PPVT), the EL1 students scored significantly higher than the ELL students, $t(46) = 5.17, p < .001$. On the English Word TOWRE, EL1 students once again scored significantly higher than the ELL students, $t(55) = 2.75, p < .01$. However, on the Non-Word TOWRE, the difference in scores between the EL1 students and the ELL students was not significant $t(57) = .99, p = .33$. For reading comprehension, the EL1 students had significantly higher scores than the ELL students, $t(57) = 3.94, p < .001$. Thus, overall and not surprisingly, the EL1 students had better comprehension, language knowledge, and English reading fluency than the ELL students.

Table 1: Mean scores on language measures for EL1s and EEL students, with standard deviation in brackets.

Language Measures	EL1	ELL
PPVT	141.25 (18.93)	102.34 (37.30)
Word TOWRE	67.04 (12.16)	56.22 (17.93)
Non-word TOWRE	33.70 (12.18)	30.31 (13.92)
Reading Comprehension	13.41 (3.89)	8.94 (4.68)

Note. Bolded values denote significant differences between languages.

3.2 Differences in Reading Strategy Recruitment

Each students' think alouds during the reading comprehension task were audio recorded and coded for reading strategies. Strategy categories include summarizing, predicting, necessary inferencing, elaborative inferencing, visualizing, questioning, utilizing background information, referring to text structure, referring to sentence structure and referring to vocabulary words. The categories were chosen based on past research in the lab and the literature. To compare which reading strategies the EL1 and ELL students were using, both the means and medians of strategy use were examined; these can be found in Table 2. Some students engaged in a particular strategy consistently, so examining the mean only would not give a full picture of the strategy use across the students. For example, if one student used a particular strategy the entire time, then the mean for that strategy might be inflated. The mean might then suggest that this strategy is used often, which would imply that it is being used by many students. Examining the median as well provides a measure of central tendency that is not impacted by outliers, giving a more comprehensive picture as to how the strategy is actually being used across the whole sample. However, just examining the median would also be problematic if a strategy was only used by a couple of students. In that case, the median might reflect that the strategy is not being used at all, which would not be representative of its actual use.

Examining both the means and the medians gives an understanding as to the distribution of a particular strategy use across participants.

Table 2. Mean and median differences between strategy use between groups.

Strategy	EL1		ELL	
	Mean (SD)	Median	Mean (SD)	Median
Summary	3.7 (3.8)	3.0	3.5 (4.3)	2.0
Necessary Inferencing	6.8 (4.2)	6.0	4.6 (4.1)	4.0
Elaborative Inferencing	7.8 (6.9)	5.0	7.8 (8.9)	4.0
Predicting	5.8 (4.6)	6.0	2.9 (3.0)	2.0
Questioning	3.8 (5.7)	3.0	2.3 (3.1)	1.0
Visualization	2.3 (4.4)	0.0	1.0 (2.2)	0.0
Background	4.3 (4.3)	3.0	3.1 (3.9)	2.0
Vocabulary	0.6 (1.2)	0.0	2.8 (5.1)	0.0
Sentence Structure	0.4 (0.5)	0.0	0.3 (0.4)	0.0
Text Structure	0.3 (0.8)	0.0	0.2 (0.6)	0.0

Note: The bolded means indicate that those strategies are used by that group significantly more than the other group.

A repeated-measures ANOVA was performed with the square-root transformed means to examine if there are any significant differences in strategy use between groups. Square-root transformed means normalize the data and minimize the impact of outliers. The ANOVA had a within-subject factor of strategy with 10 levels (summary, necessary

inferencing, elaborative inferencing, predicting, questioning, visualization, background knowledge, vocabulary, sentence structure, text structure; defining features of each strategy can be found Appendix C), and a between subject factor of group with 2 levels (EL1, ELL). Using the Greenhouse-Geisser correction, the main effect for strategy, $F(6, 350) = 35.24$ $p < .001$, was significant, however the main effect for group, $F(1, 57) = 3.00$, $p = .09$, was not. This indicates that even though it seems that the EL1 students engaged in overall more strategies, this difference between the groups was not significant. Importantly, the interaction between strategy and group was significant, $F(6, 350) = 2.10$, $p = .05$, indicating that strategy use by a student depended on the group the individual belongs to. Upon further analysis using post-hoc pairwise comparisons corrected with bonferroni, necessary inferencing and predicting were used significantly more by the EL1 students than the ELLs, $p < .05$, and the ELL students referred to vocabulary significantly more than the EL1s, $p < .05$ (see Table 2).

Given that the overall pattern of strategy use was similar across groups, pairwise comparisons were used to examine the main effect of strategy use. Elaborative inferencing was used significantly more than all other strategies except necessary inferencing, all other $ps < .05$. Necessary inferencing was also used significantly more frequently compared to the remaining strategies, all $ps < .05$, however did not differ significantly from both elaborative inferencing and utilizing background information. The next most frequently used strategies were summarizing, predicting and referring to background information. They were all significantly used more than visualization, vocabulary, sentence structure and text structure, $ps < .05$. The least used strategy was referring to text structure, which was used significantly less, $ps < .05$, than all other strategies except for sentence structure where there was no significant difference. Although there were across group differences on specific strategies as reported above, the overall pattern of strategy preferences was similar.

3.3 Relationships of Reading Comprehension with Strategy Use and with Language Knowledge/Proficiency

The correlations of reading strategy recruitment and students' language proficiency with reading comprehension performance were examined to determine which measures were related to more successful comprehension. Table 3 presents the correlations of reading comprehension with both strategy use and language proficiency scores. For the language measures, the EL1 student's data yielded large, positive correlations between reading comprehension and PPVT scores, $r = .60$, $p < .001$, English TOWRE scores, $r = .67$, $p < .001$, and the non-word TOWRE scores, $r = .51$, $p < .05$. The ELL students also showed a large, positive correlation between reading comprehension and the PPVT scores, $r = .76$, $p < .001$, and a positive, moderate correlation between reading comprehension and the English TOWRE, $r = .48$, $p < .05$, and the Non-word TOWRE scores, $r = .40$, $p < .05$. This shows that both EL1 and ELL students' successful reading comprehension is correlated with success in vocabulary, word reading fluency, and non-word decoding fluency.

When examining the correlations between reading comprehension and the reading strategies, it was found that for the EL1 students, reading comprehension was correlated with only a single reading strategy, elaborative inferencing, $r = .48$, $p < .05$. Conversely, ELL students had a large, positive correlation between reading comprehension and several different reading strategies: necessary inferencing, $r = .52$, $p < .05$, elaborative inferencing, $r = .54$, $p < .001$, and the use of background information, $r = .50$, $p < .05$, with a moderate positive correlation with predicting, $r = .34$, $p = .058$. Thus, ELL students' success in reading comprehension was related to the use of more reading strategies than EL1 students.

When partial correlations were examined, controlling for the language measures (PPVT score, TOWRE and Non-word TOWRE), there were no significant correlations between reading comprehension and the various strategies for EL1 students. For instance, when partial correlations were examined, controlling for the language measures (PPVT score,

TOWRE and Non-word TOWRE), there were no significant correlations between reading comprehension and the various strategies for EL1 students. For instance,

Table 3. Correlations between reading comprehension and the language measures/reading strategy use in each group.

Language Measure/Reading Strategy	EL1	ELL
PPVT	.60	.76
English TOWRE	.67	.48
Non-word TOWRE	.51	.35
Summary	.23	-.15
Necessary Inferencing	.33	.52
Elaborative Inferencing	.48	.54
Predicting	.20	.34
Questioning	.29	.31
Visualization	.24	.25
Background Information Use	.15	.50
Vocabulary	.03	.23
Sentence Structure	.26	.34
Text Structure	.10	.16

Note. Significant correlations are indicated by the bolded numbers.

elaborative inferencing was no longer significantly correlated with reading comprehension, $r(22) = .40, p = .09$. However, the ELL students maintained significant, partial correlations with necessary inferencing $r(27) = .58, p < .001$, elaborative inferencing, $r(27) = .50, p < .05$ and background information, $r(27) = .48, p < .05$. The ELL students also demonstrated additional significant partial correlations between reading comprehension and vocabulary, $r(27) = .40, p < .05$, and sentence structure, $r(27) = .52, p < .05$.

3.4 Prediction of Reading Comprehension Success

Step-wise multiple regression analyses were done for both ELLs and EL1s to assess which elements in concert best predicted reading comprehension success. The raw scores were used in this analysis to reflect actual vocabulary knowledge rather than norms based on age. Additionally, there was a lack of a normative sample for the ELL students. The first regression model examined the predictors for reading comprehension success in the EL1 students. The multiple regression was significant, $R = 0.78, F(3, 23) = 11.57, p < .001$, and accounted for 60.1% the variance in reading comprehension performance. For the EL1 students, English TOWRE scores, elaborative inferencing and the PPVT score all held significant positive regression weights, indicating that each variable accounted for unique variance in reading comprehension performance.

The second regression model examined the best predictors for the ELL students, and the multiple regression produced $R = 0.93, F(6, 25) = 26.03, p < .001$, and accounted for 86.2% of the variance in reading comprehension performance. For these students, their PPVT score, necessary inferencing, the non-word TOWRE score, sentence structure and elaborative inferencing all had significant positive regression weight, and summary had a significant negative regression weight. This indicates that the ELL students' successful reading comprehension was predicted by their vocabulary knowledge, their non-word reading fluency, and use of the several reading strategies (necessary inferencing, sentence structure and elaborative inferencing). This also suggests that ELL students required the use of more reading strategies than the EL1 students to engage in successful reading comprehension.

Table 4. Coefficient tables of variables that predict successful reading comprehension for both EL1 and ELL students.

Group	Predictors	B	SE	Beta	<i>t</i>	Sig.
EL1	Constant	-5.64	3.91		-1.44	.16
	English TOWRE	.12	.06	.36	2.10	.05
	Elaborative Inferencing	.18	.08	.32	2.33	.03
	PPVT Score	.07	.03	.34	2.08	.05
ELL	Constant	-1.69	1.17		-1.44	.16
	PPVT Score	.06	.01	.50	5.37	.00
	Necessary Inferencing	.39	.14	.34	2.78	.01
	Summary	-.35	.10	-.39	-3.64	.00
	Non-word TOWRE	.08	.03	.23	2.57	.02
	Sentence Structure	2.23	.93	.21	2.41	.02
	Elaborative Inferencing	.11	.05	.21	2.10	.05

To visualize the strength of both of the regression models, predicted reading comprehension scores were calculated using the equation produced by the multiple regressions, and then compared to the actual reading comprehension scores. This was

done with the data for both the EL1 students (see Figure 1), and for the ELL students (see Figure 2).

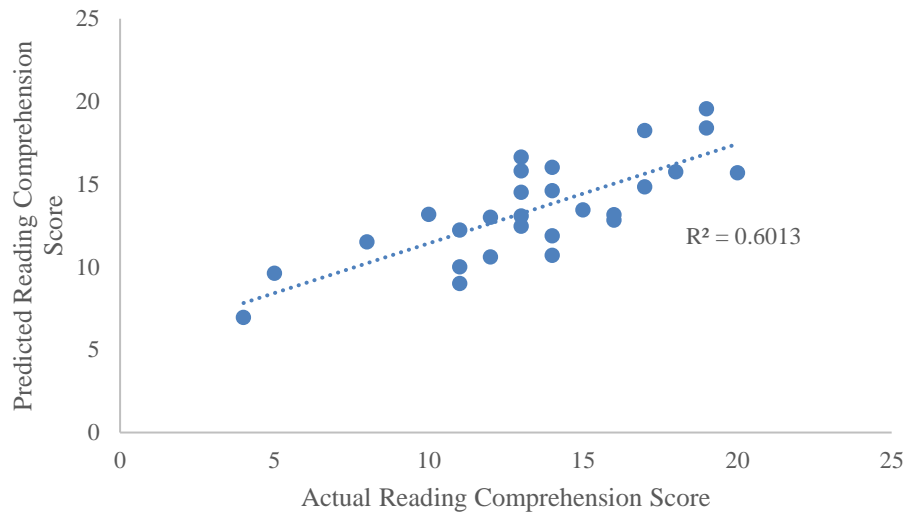


Figure 1. This figure demonstrates how EL1 reading comprehension can be predicted by a unique combination of scores from various predicting factors. EL1 Reading Comprehension = $-5.64 + .12$ (Word TOWRE) + $.18$ (Elaborative Inferencing) + $.07$ (PPVT Score).

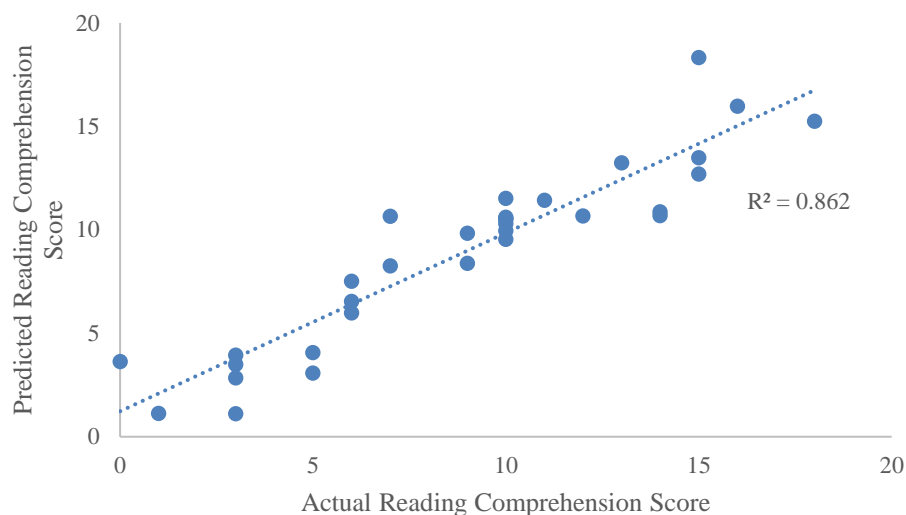


Figure 2. This figure demonstrates how ELL reading comprehension can be predicted by a unique combination of scores from various predicting factors. ELL

$$\text{Reading Comprehension} = -1.69 + .06 (\text{PPVT Score}) + .39 (\text{Necessary Inferencing}) - .35 (\text{Summary}) + .08 (\text{Non-word TOWRE}) + 2.23 (\text{Sentence Structure}) + .11 (\text{Elaborative Inferencing}).$$

3.5 Correlations Between Vocabulary Knowledge, Reading Fluency, Decoding Fluency and Reading Strategies

The EL1 students had several correlations between the various reading strategies, their PPVT score (representing vocabulary knowledge) and both the English (word reading fluency) and non-word (decoding) TOWRE (see Table 5). There was a positive correlation between their PPVT score and both the English TOWRE ($r = .60, p = .001$) and the non-word TOWRE ($r = .66, p < .001$). The English and non-word TOWRE also had a strong positive correlation ($r = .89, p < .001$). This indicates that the EL1 students who had a high vocabulary knowledge, also had good word reading fluency skills and decoding skills. There was a correlation between questioning and the English TOWRE scores ($r = .41, p = .034$), indicating that students who engaged in questioning as a reading strategy, also had higher word reading fluency.

Correlations within the various reading strategies also existed for the EL1 students. A trifecta of behaviours was demonstrated with three strategies that positively correlated together: necessary inferencing, elaborative inferencing and summarizing. Necessary inferencing correlated strongly and positively with both summarizing ($r = .71, p < .001$) and elaborative inferencing ($r = .63, p < .001$), and elaborative inferencing was also positively correlated with summarizing ($r = .43, p = .024$). This suggests that students who engaged in necessary inferencing were also likely to recruit both summarizing and elaborative inferencing to aid in reading comprehension.

Similarly to the EL1 students, the ELL students demonstrated correlations between the language measures (see Table 6). There were strong, positive correlations between the English TOWRE and the PPVT scores ($r = .51, p = .003$), and the English TOWRE and the non-word TOWRE ($r = .92, p < .001$). There was also a moderate, positive correlation between the non-word TOWRE score and the PPVT scores ($r = .38, p = .033$).

Like the EL1 students, this also suggests that ELL students who had a large vocabulary, also had good word reading fluency and word decoding skills.

There were also several correlations between the various reading strategies in the ELL population. Similarly to the EL1s, necessary inferencing was correlated positively with both elaborative inferencing ($r = .62, p < .001$) and summarizing ($r = .40, p = .025$).

Necessary inferencing also had a moderate, positive correlation with reference to sentence structure ($r = .44, p = .012$). This indicates that ELL students who engage in necessary inferencing to aid in reading comprehension also might engage in either elaborative inferencing, summarizing, or engaging in sentence structure analysis.

However, unlike the EL1s, there was no correlation found between elaborative inferencing and summarizing, thus the ELLs do not engage in the same trifecta of behaviours the EL1s do. There was also a moderate, positive correlation between the use of background information with both sentence structure ($r = .48, p = .006$) and elaborative inferencing ($r = .50, p = .004$). Another strong positive correlation was found between referring to vocabulary and questioning ($r = .55, p = .001$), indicating that ELL students who engaged in questioning as a reading strategy, also relied on commenting on vocabulary within the text.

Table 5. Correlations between the various language measures and strategy use in EL1 students. Note that the bolded correlations represent significant correlations: * denotes significance at .001, ** represents significance at .01 and * denotes significance less than .05.**

	1	2	3	4	5	6	7	8	9	10	11	12
1. PPVT Score												
2. English TOWRE	.60***											
3. Non-word TOWRE	.66***	.89***										
4. Summary	-.08	.11	-.05									
5. Necessary Inferencing	.00	.36	.16	.71***								
6. Elaborative Inferencing	.13	.31	.14	.43*	.63***							
7. Predicting	-.08	.14	.12	.02	.23	.39						
8. Questioning	.23	.41*	.30	-.05	-.02	.04	-.06					
9. Visualization	-.01	.02	-.06	.14	.11	.35	.11	.13				
10. Background Information	.15	.16	.28	.04	.00	.13	.06	.28	.12			

11. Vocabulary	-.26	.02	-.04	-.04	.01	-.11	.23	-.05	-.05	.27		
12. Sentence Structure	-.04	.26	.21	.19	.37	.34	.21	.03	.03	.27	.11	
13. Text Structure	.16	.21	.25	.28	.34	-.02	-.04	-.17	-.09	.12	.04	.00

Table 6. Correlations between the various language measures and strategy use in ELL students. Note that the bolded correlations represent significant correlations: * denotes significance at .001, ** represents significance at .01 and * denotes significance less than .05.**

	1	2	3	4	5	6	7	8	9	10	11	12
1. PPVT Score												
2. English TOWRE	.51***											
3. Non-word TOWRE	.38*	.91***										
4. Summary	-.12	.02	.08									
5. Necessary Inferencing	.22	.01	-.13	.40*								
6. Elaborative Inferencing	.32	.09	.01	.20	.62***							
7. Predicting	.39*	.15	.13	-.35	-.06	.20						
8. Questioning	.14	.17	.21	-.16	.06	.02	-.05					
9. Visualization	.23	.25	.26	-.01	.08	.09	.17	.18				
10. Background Information	.28	.22	.25	.07	.32	.50***	.02	.19	.04			

11. Vocabulary	-.04	.11	.14	-.15	.07	.14	.01	.55***	.02	.33		
12. Sentence Structure	-.01	.07	.03	.15	.44**	.14	-.08	.32	-.10	.48**	.28	
13. Text Structure	.30	.29	.29	-.20	-.22	.06	.16	.12	-.05	.07	.04	-.16

Chapter 4

4 Discussion

The goal of this research was to examine the differences in reading comprehension and reading strategy use, as well as predictors for successful reading comprehension, between ELL and EL1 students in grade 4 and 5. To accomplish this goal, language measures were used to assess vocabulary knowledge, word decoding fluency, and word reading fluency. A reading comprehension test was used to assess comprehension and strategy use in elementary school children. The EL1 students were found to have higher level of reading comprehension, vocabulary knowledge, and word reading fluency than ELL students. For both groups, it was also shown that having a high level of English vocabulary knowledge, word reading fluency and decoding skills were associated with reading comprehension success, indicating that these skills are important in reading comprehension.

With respect to strategy use, EL1 and ELL students engaged with reading strategies differently, and it was found that EL1 students engaged necessary inferencing and predicting more, whereas ELL students referred to vocabulary more. Successful reading comprehension was associated with the use of elaborative inferencing in EL1 students, however it was associated with more strategies (necessary and elaborative inferencing, predicting and the use of background information) for ELL students. Certain reading strategies were also important in predicting successful reading comprehension. For EL1 students, engaging in elaborative inferencing, having good vocabulary knowledge and good word reading fluency were all important predictors of good reading comprehension. In contrast, for ELL students, engaging in both necessary and elaborative inferencing, analyzing sentence structure, and having good vocabulary knowledge and word reading fluency all uniquely predicted successful comprehension. It is clear that engaging in elaborative inferencing, having a good knowledge of English vocabulary and word reading fluency are very important to reading comprehension, regardless of group.

4.1 Interpretation of Results

For the first research question, which examined the differences in reading comprehension and performance on language measure tasks between the two groups, it was found that the EL1 students performed significantly better on reading comprehension and other language measures than ELL students, with the exception of the non-word TOWRE (which tested word decoding ability). This finding suggests that decoding is not necessarily dependent the language background of the student. This is consistent with the research done by Droop and Verhoeven (2003) that suggested that word-decoding could be mastered fairly quickly and it not the variable that accounts for group differences in reading comprehension. The differences between the two groups on the other measures were not surprising considering the body of literature also demonstrating these differences. Monolingual children have been shown to have better reading comprehension, and more vocabulary knowledge in one language than their bilingual peers (Droop & Verhoeven, 2003; Geva & Farnia, 2012; Bialystok, Luk, Peets & Yang, 2010).

Examining these results in the context of the Simple View of Reading model (Hoover & Gough, 1990), which describes reading comprehension as a combination of decoding and language comprehension, these results suggest that difference in language comprehension between the two groups is the main cause of the discrepancy in reading comprehension scores, since both groups do not significantly different in decoding ability, but significantly differ in vocabulary knowledge. This is consistent with other research demonstrating language comprehension to be the largest predictor for reading comprehension in ELL children (Bonifacci & Tobia, 2017), and was also consistent with this researcher's predictions. It could also suggest that language experience could be a factor, since the lack of a difference was only observed on decoding but not on word reading. This suggests that the EL1s experience with real words, and the ELLs lack of experience in comparison, could contribute to the difference.

The second research question was concerned with how reading strategy use differed between groups. It was found that strategy use did significantly differ between groups: EL1s engaged in necessary inferencing and predicting significantly more, and ELLs

referred to vocabulary more. This is consistent with previous research because successful ELL readers need to devote more cognitive resources to unknown vocabulary than EL1s (Jiménez, García, & Pearson, 1996). EL1s do not need to allocate as many cognitive resources to handling vocabulary obstacles, so they can utilize other essential reading strategies, like inferencing (Graesser, Singer, & Trabasso, 1994; Kintsch, 1998; Elbro & Buch-Iversen, 2013). Even though it seemed as though the EL1 students used more strategies overall than ELLs this difference was not significant. It was expected the ELL students would have needed to use more reading strategies to offset their lack of language knowledge to reach the same level of comprehension performance as the EL1s. Since the ELLs had lower comprehension scores, thus showing that the two groups are not at the same level of comprehension performance, then it would make sense that the ELLs would not use more reading strategies than the EL1s.

The third research question investigated which variables (i.e., reading strategies, word fluency, vocabulary) were correlated with successful reading comprehension in each group. It was found that for both EL1 and ELL students, vocabulary, word reading fluency and decoding were all important skills related to successful reading comprehension. In regards to reading strategies, more strategies were associated with better comprehension for ELL students (i.e., necessary and elaborative inferencing, background information, predicting) than for EL1s, who only had one strategy correlate highly (elaborative inferencing). The Simple View of Reading speaks to vocabulary (as a proxy of language knowledge), reading fluency and decoding as importance aspects of reading comprehension (Hoover & Gough, 1990). These significant correlations are consistent with the predictions made by the Simple View of Reading Model.

Because of the significant role language skill plays in reading comprehension, it was important to examine the partial correlations to see which strategies were still correlated with reading comprehension after language ability was controlled for. For ELL students, most correlations between comprehension and reading strategies remained (necessary and elaborative inferencing, background information, vocabulary, sentence structure). For the EL1 students, the correlation between reading comprehension and elaborative inferencing was no longer significant. These results suggest that ELL students' reading

comprehension success is related to multiple reading strategies, outside of the language measures, while the EL1 students' reading comprehension success is related to only elaborative inferencing, in conjunction with the language measures. For the EL1 students, this result implies that their success on the language measures, and the use of the skills needed to be successful on the language measures (vocabulary, word reading fluency, decoding), are more important to reading comprehension success than the use of reading strategies alone.

The fourth research question aimed to address which variables best predicted reading comprehension success. For EL1 students, predictors for successful reading comprehension included: vocabulary knowledge, word reading fluency and elaborative inferencing. For ELL students, the predictors for good comprehension were vocabulary knowledge, decoding, elaborative and necessary inferencing, sentence structure, and not engaging in summary. It was hypothesized that the ELL students would have more reading strategies as predictors for reading comprehension success due to lower language proficiency, which was supported. This result is interesting because earlier it was shown that ELLs did not engage in more strategies overall. This suggests that while they did not utilize more strategies, the strategies they did use were essential to their reading comprehension success.

It is interesting to note that vocabulary knowledge and elaborative inferencing were important predictors for both groups. The involvement of elaborative inferencing is consistent with the Construction Integration model of reading (Kintsch & van Dijk, 1978), which describes reading as creating a mental representation of the text by integrating information from the literal text, inferencing information from the text and background information. This result is also consistent the Simple View of Reading model because of the involvement of vocabulary knowledge in predicting reading comprehension. It is not surprising that decoding is predictive for ELL success, because ELL students have a tendency to engage in more bottom-up processing of text because they do not have the same language knowledge as the EL1 students (Droop & Verhoeven, 2003; Friesen & Jared, 2007).

Another unexpected result that was found reflected some of the ELLs behaviour during testing. It was found that for ELL students' regression equation, summarizing carried a negative regression weight, meaning that successful reading comprehension was predicted by not engaging in summary. One possibility for this finding is an interesting pattern of responding exhibited by some ELL students with respect to summarizing. There were two types of summarizing: one where readers paraphrased and often then made necessary or elaborative inferences to further understand the text, and another where they simply repeated back the text. Repeating the sentences verbatim did not necessarily reflect an understanding of the material, and that is possibly demonstrated by the negative regression weight. It means that students who engaged in summarizing in concert with the other predictors (e.g., necessary inferencing) would have better reading comprehension success.

The final research question investigated which reading strategies and reading skills were correlated with each other, or if students were engaging in one reading strategy, which other reading strategies might they also be using. For both the EL1 and ELL students, a relationship was found between vocabulary knowledge, reading fluency and decoding, meaning that students who had good vocabulary knowledge, were likely to have good decoding and word reading fluency. This finding is interesting when considering language knowledge as a whole. Vocabulary, decoding skills and word reading fluency are important components of language proficiency, and it seems as though these develop concurrently as language proficiency increases since the ELLs demonstrated the same pattern as the EL1s. If they developed at different speeds, then it would be expected that the ELLs would not have vocabulary, word reading fluency and decoding all correlated together since they have lower language proficiency than the EL1 students.

A similar result was also found within reading strategies for the EL1s. The use of necessary inferencing, elaborative inferencing and summary were all correlated with each other. It seems as though the EL1 students who engaged in one of these behaviours, was also likely to engage in one or both of the other two, making the use of these reading strategies a trifecta of behaviours for EL1 students. ELL students on the other hand, did not demonstrate the same trifecta. They had correlations between the use of necessary

inferencing and summarizing, and necessary inferencing and elaborative inferencing, but there was no relation between summarizing and elaborative inferencing. Because EL1 students had better reading comprehension overall, and elaborative inferencing is a predictor of reading comprehension, it is possible that engaging in all three behaviours at once could be important for better reading comprehension. For example, if a student was summarizing the text, they might also make necessary and elaborative inferences about the text to make connections within the text, which would aid in comprehension overall. In the text “Tommy threw a ball and the window broke”, the student could engage in all three behaviours by summarizing: “Tommy was playing with a ball (elaborative inferencing) and he threw it at the window (necessary inferencing) and it broke”. It is also possible that the lack of the tight link between these strategies for the ELL students might suggest that they are at an earlier stage of development of reading comprehension and strategy use in English.

ELL students also had more correlations between various reading strategies than EL1 students. ELL students showed correlations between elaborative inferencing and background information, background information and sentence structure, and sentence structure and necessary inferencing. These correlations are also consistent with the Construction-Integration model of reading (Kintsch & van Dijk, 1978) because inferencing and contextual knowledge are important in reading comprehension. An interesting correlation was demonstrated between referring to vocabulary and questioning, which seemed reflective of some ELL students’ behaviour during testing. Some students asked the researchers questions during the reading comprehension task about the text, both asking about vocabulary and the meaning of the text.

4.2 ELL Participants and Limitations

Overall, the ELL sample was heterogenous in nature, which caused several limitations. The ELL participants originated from many different countries with various language backgrounds. Some of the participants have moved to Canada from other countries where English is not the official language very recently, therefore they have only recently begun learning English. Of the ELL students, 19% have only lived in Canada for a year or less, 19% for two years, and 16% for three years. This means that over half of the ELL sample

have been in Canada for less than four years. It is curious whether or not these students have enough language knowledge to be successful comprehenders. Research done with five year old children in Canada found that it takes just under three years for ELL children to gain a comparable amount of English language knowledge to their EL1 peers (Goldberg, Paradis & Crago, 2008). As the research indicates, language knowledge is integral to reading comprehension, so some of the ELL participants in this study may not have reached a minimum level of language knowledge for successful reading comprehension. This means that the differences in reading comprehension and strategy use might be solely due to language knowledge differences between the two groups, as opposed to group differences outside of language knowledge such as the effects of being bilingual. However, this population is more representative of a community with recent immigration, making this population still critical to examine.

When testing the ELL children, the researchers requested that the students to speak in whatever language they felt most comfortable using. The rationale was that if children were to be able to use their native language to help them understand text better, it could assist in their learning. Research has shown that ELLs in the United States who were restricted to communicating solely in English had more difficulty learning and with reading comprehension than if they were able to use both English and their native language (Hopewell 2011). If the students answered in another language, a translator would be used to translate and transcribe the student's think-alouds and answers to the reading comprehension questions. However, all the EL1 students answered in English as opposed to their native language. This could mean that the children felt most comfortable answering in English, or that they chose to answer in English regardless if they felt most comfortable or not. The results could have been altered if the students answered in their native language, however the current results are a reflection of ELL reading comprehension in a Canadian school system, where the students are required to read in English and respond in English.

4.3 Future Directions

When considering future research in this field, it would be interesting if further research could be done with an ELL population that has been living in Canada for longer, or have

higher language proficiency. This is in light of the fact that ELL students who have been in Canada for less than two years might not have same level of English language knowledge as their EL1 peers (Goldberg, Paradis & Crago, 2008). Examining students who have been in Canada for longer and who have more language knowledge would give an indication as to the differences in reading comprehension and strategy use between ELL and EL1 students outside of language knowledge. It would be interesting to see whether or not differences seen in strategy selection and predictors of reading comprehension between the two groups are due to the phenomenon of being bilingual and knowing two languages, or if the differences are due to lower proficiency in the language the student is reading in. In other words, it would be interesting to explore if the differences are solely due to language comprehension, or is there something fundamentally different about ELLs and bilinguals that make their behaviour differently in terms of reading comprehension.

One explanation for the difference between the groups, outside of language knowledge, could be executive control, thus future research could also examine the role of executive control and the impact it has on reading comprehension. Currently, executive control has not been examined as a factor in the context of reading comprehension and strategy use, even though bilinguals have been shown to excel on tasks that require executive control (Friesen, Latman, Calvo, & Bialystok, 2015; Marian & Shook, 2012). Executive control refers to the higher cognitive processes and controls that influence goal-oriented behaviour. It is responsible for functions such as inhibiting behaviours, updating information as it is presented, and shifting attention between different tasks (Miyake et al., 2000). This effect of bilingualism on executive control is not only seen in adults, but in children as well. Children who are bilinguals are better at tasks involving active inhibition, a facet of executive control, than their EL1 peers (Carlson & Meltzoff, 2008). Bilinguals are believed to have this enhanced executive control when compared to monolinguals because of their ability to switch between languages and actively inhibit their one language while speaking the other (Bialystok, Craik & Luk 2008; Verreyt et al., 2016). A link has also been found between executive control and utilising reading strategies. In an fMRI study by Moss, Schunn, Schneider, McNamara and VanLehn (2011) showed activation in the brain regions responsible for executive control and for

comprehension while the participant was utilising reading strategies. This link demonstrates the importance of conducting future research on the relationship between executive control, reading comprehension and reading strategy use in the context of ELLs, and how executive control could be potentially leveraged by reading strategies use to assist ELL students in their reading comprehension.

It has been shown that reading comprehension is very importance for future success, both academically and professionally (August & Shanahan, 2006; Polinsky & Kagan, 2007). There has also been a link shown between poor reading comprehension and mental health difficulties (Carroll, Maughan, Goodman, & Meltzer, 2005), which will be discussed further below. Further research should also explore the longitudinal link between mental health and literacy to explore how reading comprehension is related to overall wellness and mental health.

4.4 Implications

This research has many implications for ELL students. As previously mentioned, reading comprehension is important for success in academics and future careers (August & Shanahan, 2006; Polinsky & Kagan, 2007). Examining how ELL students utilize different reading strategies to aid in comprehension provides insight as to how the ELL students engage with material. This research contributed valuable information to the body of literature, and it could also be used to assist in ELL learning in schools. Firstly, it was demonstrated that vocabulary knowledge and wording reading fluency were correlated with reading comprehension success. Beyond that, vocabulary knowledge and decoding helped to predict good reading comprehension, along with several reading strategies (necessary and elaborative inferencing, sentence structure). It is interesting to note that two reading strategies that can be taught and that have been shown to be effective in reading comprehension, visualizing and questioning (Reutzel, Smith, & Fawson, 2005), were not used significantly by the students in this study. It is curious whether or not these strategies are not being focused on enough in reading strategy instruction in schools, or if this population was unique by not engaging in these strategies. These results could be used in schools by focusing reading education for ELL students on these strategies and

skills, however it is cautioned that the relationships shown are correlations and cannot be used for a casual purpose.

There has been much research done to identify reading strategies that can be taught to children to aid in comprehension and knowledge retention (Brown, Pressley, Van Meter, & Shuder, 1996). Research has shown that strategies that engage metacognitive thinking, or strategies that make students aware of their own thinking, are important for effective reading, and these types of strategies can be taught to students (Lika, 2017). Some examples of metacognitive reading strategies are utilising background knowledge, predicting, comprehension monitoring, making inferences, questioning and summarizing (Lika, 2017). Not only is it important to examine which reading strategies should be taught, but also how they can be taught. Reutzel, Smith, and Fawson examined (2005) if teaching young children (7-8 years old) strategies one at a time or as a “set” of strategies would enhance comprehension and knowledge retention. They found that explicitly, there was no difference between the two methods on comprehension. However, the students that were taught a “set” of comprehension strategies had better knowledge retention, both content and elaborated knowledge, and had better standardized test scores than students who were taught reading strategies one at a time (Reutzel, Smith, & Fawson, 2005). Research has also examined the medium of teaching reading strategies as well. Research done by Ponce, López, and Mayer (2012) tested the effectiveness of a computer-based program to teach reading strategies when compared to more traditional instruction. The program, developed through research, which taught strategies such as paraphrasing, vocabulary, questioning, text structure and summarizing. They engaged with students and teachers across different regions and schools in Chile and had 939 students use the computer program, while 102 students received traditional instruction. Students who used the computer program showed significantly higher post-test scores on reading comprehension, particularly for lower-achieving students, than the students who received traditional instruction. However, they did not examine the students who were receiving traditional instruction, and whether the improvement was due to solely being taught reading strategies or due to the computer program itself (Ponce, López, & Mayer, 2012). It is interesting to examine the different methods of teaching reading strategies in light of this current research. In future, it might be possible to combine the methods of teaching

reading strategies with the strategies shown to be most effective and linked to reading comprehension success for specific populations. That way, instruction can be tailored for and targeted directly at a specific population to aid in improving reading comprehension.

Improving reading comprehension success is not only important for children's future success, but for their mental health as well. It has been shown that poor reading success has been associated with mental health difficulties in children such as depression, anxiety, behavioural problems (Carroll, Maughan, Goodman, & Meltzer, 2005).

Researchers investigated links between literacy difficulties and mental health challenges of 5,752 children in the UK between the ages of 5-15. They examined the children's cognitive abilities, literacy difficulties, and behavioural, emotional and psychiatric problems (Carroll, Maughan, Goodman, & Meltzer, 2005). They discovered that poor reading success was connected with an increased risk of ADHD, Conduct Disorder, and anxiety disorders, and it was also associated with self-reported low mood in boys. The researchers also suggested a direct link between poor literacy and risk of clinical anxiety in already anxious children. It is clear that successful reading comprehension is incredibly important for children's mental health, making this research quite valuable.

Language proficiency has also been linked to a sense of belonging within the host country (Amit & Bar-Lev, 2015). Research done by Amit and Bar-Lev (2015) looked at 587 immigrants in Israel and examined a proposed model in which life satisfaction is an important predictor of a sense of belonging in the host country. Some of the variables included in the model were religious affiliation, religious motivation, ethnic segregation and language proficiency. They found that language proficiency was linked to both life satisfaction and a sense of belonging in the host country. A sense of belonging is vital and has been shown to be a predictor for a sense of self-esteem (Baumeister & Leary, 1995), well-being (Branscombe, Schmitt, & Harvey, 1999), and integration (Phinney, Horenczyk, Liebkind, & Vedder, 2001). As mentioned above, further research should explore a direct link between reading comprehension and literacy and overall wellness and mental health so the importance of research in reading comprehension can be seen more clearly.

4.5 Concluding Remarks

This research has given insights into the differences in reading comprehension and reading strategy use between ELL and EL1 children in Canada. Overall, the EL1 students were better comprehenders, and it is suggested that this could be due to a greater language knowledge than their ELL peers. EL1 students reading comprehension was best predicted by word reading fluency, vocabulary knowledge and engaging in elaborative inferencing. Whereas ELL students' reading comprehension success was best predicted by their vocabulary knowledge, decoding ability and using elaborative and necessary inferencing, as well as examining the sentence structure. However, more research should be done to examine if the differences between reading comprehension and strategy use between the two groups are solely due to the language knowledge and experience, or if the groups are fundamentally different because one group is bilingual. Hopefully, through this and future research, educators could potentially leverage these strategies and skills to assist in reading comprehension, it can help ensure ELL students' successful reading comprehension, and therefore, successful futures, mental health, a sense of belonging and wellbeing, and inclusion into a multi-cultural Canada.

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Appendices

Appendix A: Parent Guardian Questionnaire

1. Todays date (day/month/year): -

2. Relationship to participant (please circle): Mother Father Other: _____

Part A – Background Information

The following information refers to your CHILD:

3. First Name: _____ Last Name: _____
4. Date of birth (day/month/year): _____
5. Gender: _____
6. Grade: _____
7. Country of birth: _____

The following information refers to the PARENTS:

8. Country of birth of GUARDIAN 1: _____

If not born in Canada, when did guardian 1 come to Canada (year): _____

List the language known by guardian 1, *in order of acquisition (first learned to last learned)*:

List the language known by guardian 1, *in order of fluency (best known to least known)*:

9. Country of birth of GUARDIAN 2: _____

If not born in Canada, when did the guardian 2 come to Canada (year): -

List the language known by guardian 1, *in order of acquisition (first learned to last learned)*:

List the language known by guardian 1, *in order of fluency (best known to least known)*:

Part B – Child’s Language

10. Which language did your child first speak?

English ☐ Another language(s) ☐ Both/All at the same time ☐

11. Does your child ***understand*** any language other than English? yes ☐ no ☐

If **yes**, how would you rate your child’s understanding of the other language(s)?

Name other language(s)	Poor	Fair	Moderate	Good	Excellent
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Does your child ***speak*** any language other than English? yes ☐ no ☐

If **yes**, how would you rate your child’s speaking of the other language(s)?

Name other language(s)	Poor	Fair	Moderate	Good	Excellent
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. Approximately, how many hours a week does your child read in English

at home? _____

14. Approximately, how many hours a week does your child read in another language

at home? _____

15. Please rate how strongly you agree with the following statements by checking (✓) the boxes that best apply (*English*):

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
My child prefers to read in English					
My child is a good English reader					
My child enjoys reading in English					

Part C: Language in the Home

For each of the following, please indicate with a check mark (✓) the use of language in your home for that activity. If a question does not apply to your family, please indicate by writing N/A.

[illegible]

Language **CHILD** uses for:

[illegible]

Overall, language your **CHILD** uses to speak:

[illegible]

Appendix B: Prompt Sheet

Prompts
I imagine that...
I predict that...
I wonder if...
This means that....
This makes me think of...
I don't know...

Appendix C: Example of Think-Aloud Strategy Coding

Strategy	Definition
Summary	Re-stating (either verbatim or paraphrased) information from the story
Necessary Inference	Referring to information gleaned from the text that is necessary for understanding
Elaborative Inference	Referring to information gleaned from the text that is beyond what is necessary for understanding
Prediction	Referring to potential outcomes or events that may happen within the story
Question	Referring to any queries that the student may have about the content of the text
Visualization	Referring to a mental picture the student has created
Background Knowledge	Referring to knowledge that the student has acquired elsewhere (i.e. in school, other texts), or from other parts of the text
Vocabulary	Referring to words within the text, or asking questions about vocabulary
Text Structure	Referring to the type of text in the story
Sentence Structure	Referring to the sentence in the story

Appendix D: Ethics Approval



Date: 15 December 2017

To: Dr. Deanna Friesen

Project ID: 109301

Study Title: Reading Comprehension and Strategy Use in English Language Learners and English Monolinguals in Elementary School

Application Type: NMREB Amendment Form

Review Type: Delegated

Full Board Reporting Date: 12/Jan/2018

Date Approval Issued: 15/Dec/2017 17:18

REB Approval Expiry Date: 24/May/2018

Dear Dr. Deanna Friesen,

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the WREM application form for the amendment, as of the date noted above.

Documents Approved:

Document Name	Document Type	Document Date	Document Version
Ethics_Protocol_109301_DFRIESEN_Nov27_clean	Protocol	27/Nov/2017	
Friesen_LOI_revised_Nov14th_clean	Written Consent/Assent	14/Nov/2017	

Documents Acknowledged:

Document Name	Document Type	Document Date	Document Version
Friesen Approval	Cover Letters/Memos	23/Nov/2017	
TVDSB_memo_DFriesen_Responses	Cover Letters/Memos		

REB members involved in the research project do not participate in the review, discussion or decision.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario. Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB. The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Please do not hesitate to contact us if you have any questions.

Sincerely,

Katelyn Harris, Research Ethics Officer on behalf of Dr. Randal Graham, NMREB Chair

Note: This correspondence includes an electronic signature (validation and approval via an online system that is compliant with all regulations).

Curriculum Vitae

Name:	Katherine Schmidt
Post-secondary Education and Degrees:	University of Guelph Guelph, Ontario, Canada 2011-2015 B.Sc. The University of Western Ontario London, Ontario, Canada 2017-2019 M.A.
Honours and Awards:	Province of Ontario Graduate Scholarship 2017-2019 Poster Presenter of Research Findings Robert MacMillian Symposium in Education London, Ontario 2019
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